

Somatic Cell Count MACE

– UK Response and Trend Validation

G J T Swanson, R A Mrode and C M Lindberg

Animal Data Centre Ltd., Fox Talbot House, Greenways Business Park, Chippenham, Wilts SN15 1BN

Introduction

Interbull has been carrying out a research project into the feasibility of an International evaluation for Somatic Cell Counts. The preliminary results of the Interbull feasibility study were reported at the annual Interbull meeting in BLED (Mark et al, 2000). A full test run, including UK Holstein Friesian PTAs from the August 1999 evaluation run, was carried out and supplied to each country.

In preparation for official acceptance of the Interbull evaluations in the UK, it was necessary to carry out various analyses on trend validation and to compare the Interbull evaluations with the UK official converted evaluations.

Trend Validation

Methods 1 and 2 as specified by Interbull were applied to the UK SCC data which included 2477 bulls born since 1982 with daughters in at least 10 herds.

In both cases the trend statistic was lower than the expected value of $0.01 \times \sigma_G$, indicating that there were no trend problems for acceptance of the UK data.

Figure 1 shows a comparison of trend for first and all lactations.

Comparison of Interbull and converted evaluations

The analysis presented is based on bulls marketed in the UK, i.e. available bulls. The Interbull results were matched with a file of converted SCC PTAs produced from UK official conversion formulae.

Results

Table 1 shows the basic statistics for the bull groups analysed. The analyses were further subdivided by country of registration.

The averages, range and standard deviation for the Interbull and converted PTAs were very similar for all groups of bulls. In the case of the averages, there was no consistent trend towards Interbull or converted PTAs. In some cases Interbull was higher and vice versa.

The standard deviation was generally lower for converted SCCs. The largest difference was France, where the converted PTAs had a higher mean and standard deviation.

The correlations between the Interbull and converted PTAs are shown in Table 2. As expected, for UK progeny test bulls the correlation was 0.99. In the case of the individual countries, the correlations ranged from 0.91 (Canada) to 0.98 (France). With all bulls (368) included the correlation between the Interbull and converted PTAs was 0.95.

Figure 2 shows the relationship between converted SCC PTAs and Interbull PTAs for bulls with no UK daughters and a difference in reliability of less than 10%. All correlations increased to at least 0.97 when the reliability restriction was included.

Conclusion

Although SCCs have a low heritability, the measurement itself is similar in all countries. This was reflected in the high correlations obtained from the limited data sets used to estimate conversions for use by the UK and the high genetic correlations among countries obtained by Interbull.

The correlations obtained from various analyses comparing Interbull and converted PTAs are generally in excess of 0.95.

The trend validation statistics are within the specified limits. The results confirm that UK

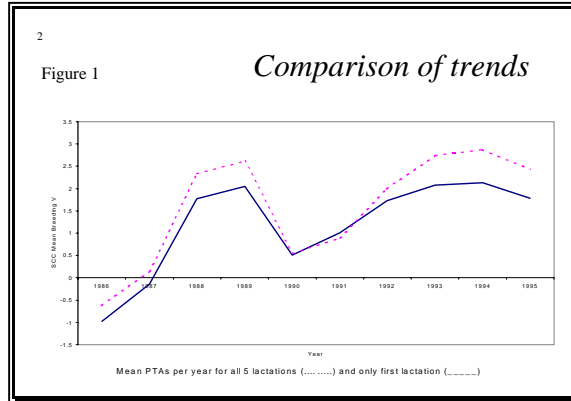
data should be included in an International MACE. The generally close agreement between converted and Interbull evaluations shows that there will not be major changes for most bulls.

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SCC - Trend Validation

• Method 1	a	b
First Lactation	1.639	-0.02
All (5) Lactations	1.724	0.01
• Method 2		
Analysis of DYDs		-0.11

SCC $\sigma_G = 21.9$
Statistic $21.9 \times 0.01 = \underline{0.22}$



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Comparison between Interbull and converted evaluations - SCC

Table 1

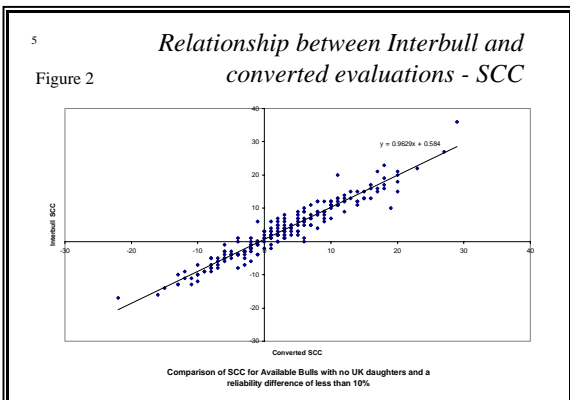
Available Bulls	Breed	No.	ITB SCC				UK SCC			
			Mean	SD	Min	Max	Mean	SD	Min	Max
All Bulls		368	3.1	8.6	-17	36	3.2	8.5	-22	30
UK		20	2.5	7.6	-10	15	2.8	7.5	-10	14
Netherlands		45	3.1	8.8	-15	20	3.1	8.9	-15	25
Canada		27	2.6	8.9	-11	28	1.8	8.7	-15	25
USA		241	3.1	8.7	-17	36	3.0	8.4	-22	30
France		54	3.0	8.1	-13	22	5.2	8.6	-11	23

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Correlations between Interbull and converted SCC PTAs

Table 2

	Correlation
Available Bulls (368)	0.95
UK	0.99
Netherlands (45)	0.97
Canada (27)	0.91
USA (241)	0.96
France (54)	0.98



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Conclusions

- Trend validation - Methods 1 and 2 within limit.
- SCC measurement consistent across countries, leads to high correlations among countries.
- Correlations between converted UK PTAs and Interbull PTAs high > 0.95.
- Correlation between UK PTAs and Interbull PTAs 0.99.
- Recommend Interbull introduces an official service.